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STATE OF SOUTH CAROLINA
BEFORE THE PUBLIC SERVICE COMMISSION
DOCKET NOS. 2018-8-E & 2018-10-E

In the Matter of:	)	COMMENTS OF SOUTH CAROLINA
	)	COASTAL CONSERVATION
Duke Energy Carolinas, LLC and	)	LEAGUE, SOUTHERN
Duke Energy Progress, LLC	)	ALLIANCE FOR CLEAN ENERGY
Integrated Resource Plans	)	AND UPSTATE FOREVER

The South Carolina Coastal Conservation League, Southern Alliance for Clean Energy and Upstate Forever (collectively, "Petitioners") respectfully submit the following initial comments on the 2018 Integrated Resource Plans ("IRPs") of Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, Inc. ("DEP") (collectively, "Duke Energy" or "Duke").

INTRODUCTION

The spectacular failure of planning embodied in the V.C. Summer nuclear fiasco underscores the importance of electric utility IRPs and the need for vigorous Commission oversight of IRPs. Yet over the last decade, the Commission has declined to engage substantively in IRP proceedings to ensure that reasonable alternatives are properly evaluated and that resource planning choices minimize costs and risks for customers. In the comments that follow, Petitioners offer an overview of several key issues arising from the DEC and DEP 2018 IRPs. We ask that the Commission review the 2018 DEC and DEP IRPs carefully, consider these comments and those of other intervenors and ORS, and require the Companies to correct any deficiencies identified by the Commission in light of these comments.

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SUMMARY

Duke Energy could save customers money and develop a more flexible, low-risk system with greater reliance on cleaner energy resources:

- A resource portfolio with higher levels of energy efficiency, solar and wind could save ratepayers billions of dollars over the planning horizon.
- The reserve margins used in the 2018 IRPs were improperly inflated.
- The shift by DEC and DEP to planning for "winter-peaking" systems should be carefully scrutinized.
- Energy efficiency and renewables are increasingly cost-effective. Higher levels of energy efficiency, wind and solar could avoid or defer the need for new gas-fired power plants and enable accelerated retirement of coal units. Yet Duke inappropriately limited the amounts of energy efficiency, solar and wind by imposing artificial constraints and disregarding the potential for these resources.
- Duke should evaluate the economics and reliability implications of accelerated retirement of coal plants, rather than simply planning to retire them at the end of their depreciation book life.

However, Duke's 2018 IRPs do include some steps in the right direction:

- The DEC and DEP IRPs include a meaningful amount of battery storage, which will support addition of solar and other clean energy resources on their system as well as providing a new resource for balancing grid supply and demand, a new tool for peak shaving, and other benefits.

DISCUSSION

A. South Carolina IRP requirements.

The crucial legal question before the Commission with respect to the 2018 Duke IRPs is whether they "minimiz[e] the long run total costs of the utility's overall system and produce[] the least cost to the consumer consistent with the availability of an adequate and reliable supply of electricity while maintaining system flexibility and considering environmental impacts."

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Commission Order No. 91-1002.[1] This question must be answered in the context of an uncertain regulatory environment and an evolving power marketplace, in which energy efficiency and renewable energy resources have emerged as low-cost resources that can displace coal- and gas-fired generation and defer or avoid the need for new gas and nuclear capacity.

The 2018 Duke IRPs also must be considered in light of the State policy goals in the State Energy Plan, which call on the utilities to "ensure access to energy supplies at the lowest practical environmental and economic cost" and "ensure that demand-side options are pursued wherever economically and environmentally practical." S.C. Code Ann. § 48-52-210. In furtherance of the goals of the State Energy Plan, the South Carolina Energy Office convened a resource planning subcommittee. That subcommittee, in which staff of Petitioners have actively engaged, explored the current state of integrated-resource planning in South Carolina, past IRP rules and processes, examples from other states, and best practices for developing IRPs. The consensus recommendations of the subcommittee are attached as an Addendum to these comments.[2]

B. Duke's load forecasts require further study.

The load forecast is a major factor determining a utility's need for new resources to meet system energy and demand. Overstating load growth will result in excess capacity on the system, and excess costs borne by ratepayers. Over the 15-year planning horizon, DEC forecasts an annual average growth rate of 1.0% (summer) and 0.9% (winter) with energy growth of 0.8%. DEP forecasts an annual average growth rate of 0.8% (summer) and 0.7% (winter) with energy

[1] While the Commission modified the IRP reporting requirements in Order No. 1998-502 and Order No. 2012-96, in doing so, the Commission did not alter the objective of the IRP process,

[2] South Carolina Energy Office, IRP Guidelines, available at http://www.energy.sc.gov/files/view/IRP%20Guidelines%20Consensus_LM2_0.pdf (accessed Feb. 15, 2019).

growth of 0.5%. While these forecasts appear more reasonable than in the past, they should be carefully examined. Further, it is too soon to draw a conclusion about the Companies' winter peak load forecasts because the instances of loads exceeding the forecasts have generally occurred under very unusual extreme cold events (such as "Polar Vortex" events). The Companies should further research the drivers of sharp winter load spikes under extreme cold conditions, and develop demand response programs and other strategies for shaving these spikes.

C. The reserve margins used in the 2018 IRPs were improperly inflated.

Both 2018 IRPs use a 17% winter planning reserve margin, an increase relative to the reserve margins used before the 2016 IRPs. These planning reserve margins used in developing the IRPs were, in turn, based on resource adequacy studies conducted by Astrape Consulting in 2016 ("2016 RA Studies"). Due to a number of flaws in the 2016 RA Studies that improperly inflated the reserve margins, the DEC and DEP reserve margins are excessively high. The RA Studies exaggerated the risk and magnitude of extreme winter peak loads, calling into question the shift by DEC and DEP to planning for "winter-peaking" systems. The RA Studies also substantially overstated the risk of very high loads under extreme cold, mainly due to a faulty approach to extrapolating the increase in load due to very low temperatures. In addition, due to the RA Studies' assumptions about demand response capacity and operating reserves applicable to winter peak conditions, the winter resource adequacy risk was substantially overstated relative to the risk in summer and other periods of the year. The use of overly high reserve margins in the IRPs means that DEC and DEP are planning to add too much new capacity on the system, which would add unnecessary costs for ratepayers.

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D. Duke's IRPs undervalue and underproject solar resources.

1. Duke undervalues the capacity that solar provides to the DEC and DEP systems.

Commendably, the Duke utilities plan to increase the amount of solar on their systems by over 3,600 MW over the planning horizon. Duke grossly undervalues solar's capacity value, however. Solar likely provides greater benefits to the system than Duke assumes. At the same time, the Companies should be planning to include significantly more solar over the planning horizon.

The capacity values for solar resources were based on an Astrapé report that employs the same model and many of the same assumptions that were used in the RA Studies.[3] Duke's data and its method for calculating solar capacity values were severely flawed, however, resulting in a dramatic undervaluing of solar's capacity benefit to the DEC and DEP systems. Duke's projections also fail to account for likely improvements in solar capacity values from a technological perspective (i.e., continued improvements in conversion of solar energy into electricity) and are on the low end of what has been observed from projects that have been put in service in recent years.[4] For example, DEP projects summer solar PV capacity values of 8.2 to 12.4 percent (DEP IRP, p. 42), far lower than the weighted average of 27.6 percent observed in projects installed nationally over the last ten years. These flawed assumptions have important implications not only for Duke's treatment of solar resources in its IRPs, but also for avoided

[3] *Duke Energy Carolinas and Duke Energy Progress Solar Capacity Value Study*, August 27, 2018 ("Capacity Value Study"), produced in response to SACE/NRDC/Sierra Club Data Request 1-28 in NCUC Docket E-100, Sub 157.

[4] "The capacity factors of individual [utility-scale solar PV] projects in this sample range widely, from 14.3% to 35.2%, with a sample mean of 26.0%, a median of 26.3%, and a capacity-weighted average of 27.6%." Mark Bolinger, et al, *Utility-Scale Solar: Empirical Trends in Project Technology, Cost, Performance, and PPA Pricing in the United States*, Lawrence Berkeley National Laboratory (Sept. 2018), at p. 23 (https://emp.lbl.gov/sites/default/files/lbnl_utility_scale_solar_2018_edition_report.pdf).

costs. Duke's switch to a "winter-peaking" paradigm will significantly and negatively impact the capacity value applied to solar energy resources.

2. Duke should reevaluate its projections for addition of new solar resources.

Duke Energy Progress projects that it will have 4,199 MW of nameplate solar PV on its system over the next 15 years. But DEP anticipates that the bulk of that growth—approximately 1,000 MW of the total 1,441 MW—would occur in the next five years, coincident with its solar procurement obligations under North Carolina House Bill 589. In other words, after increasing by roughly 36 percent in the first five years (from 2019 to 2023), DEP anticipates only another 11.6 percent—from 3,760 MW to 4,199 MW—over the next ten years (from 2023 to 2033). DEP IRP, p. 27.

DEC's IRP suffers from the same limited vision. DEC anticipates more than doubling the installed solar on its system in the first five years (2019-2023), from 1,218 MW to 2,532 MW, but then growing at a much slower rate thereafter. In other words, DEC anticipates adding about 262 MW per year in the first five years of its planning horizon, slowing down to about 90 MW per year in the last ten years. DEC IRP, p. 31.

These projections do not reflect the recent trends in accelerated solar installations in the Carolinas nor the continuing and steep cost-declines for solar PV. Nor is it reasonable for Duke Energy to plan for such minor, incremental investments in what is proving to be the least-cost generating resource. The Commission should order Duke Energy to reevaluate its projections for future solar installations using more realistic assessments of current and likely future cost declines and improved panel efficiencies.

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E. The Duke IRPs underutilize cost-effective demand-side management and energy efficiency.

Demand-side management ("DSM") and energy efficiency ("EE") should be evaluated on a level playing field with supply-side resources. This may be done by allowing the planning models to "select" DSM or EE as a resource, or by modeling varying levels of efficiency without screening out a subset of efficiency potential based on arbitrary criteria. Duke artificially limited the amounts of energy efficiency available as a resource to DEP and DEC through an overly restrictive screening process. Screening out demand-side options prior to running the resource planning models biases the analysis in favor of supply-side options. Further, Duke's planning process does not allow energy efficiency to be easily compared with supply-side resources in a capacity expansion model. Coupled with the inappropriate constraints that Duke placed on energy efficiency potential, DEC and DEP IRPs underutilize cost-effective energy efficiency, resulting in a higher-cost "preferred" portfolio.

The base-case efficiency forecast in the 2016 Nexant market potential studies on which Duke relied in developing its IRPs was overly conservative. This can be readily seen from the sharp reduction in savings that the Companies anticipate based on those Nexant studies. Duke's near-term projections are based on their current five-year plans, which show significant savings from EE and DSM programs over the next five years. But when the longer-term projected savings that are based on the Nexant studies (for 2028 and beyond) are merged into those near-term projections, Duke shows steep declines in anticipated energy and demand savings. These longer-term projections are not consistent with recent experience and should be revisited.

For example, DEC assumes that no new DSM capacity will be added to help meet winter or summer peak demand or reserves after 2024, and projects decreasing reductions to peak from EE investments after 2027. Duke projects significant, though declining, savings on peak from its

EE investments in the near term, but projects those savings to rapidly drop off in the out years. Similarly, DEP anticipates no growth in use of Energy Wise for Business, Large Curtailable Load, or CIG Demand Response after 2024; and practically no growth in use of EnergyWise for Home after 2022. Almost all of the limited growth in summer peak load impacts from DSM programs comes instead from Distribution System Demand Response. DEP IRP, p. 146. DEC anticipates no additional growth in load impacts from its DSM investments on summer or winter peak after 2023. DEC IRP, p. 167. In their high energy-efficiency energy case reduction projections, both companies show significant (8 to 10 percent per year) increases in MWh reductions from efficiency program over the first five years, declining to much small yearly increases from efficiency investments in the later years (4 to 5 percent per year). None of these projections are consistent with the Company's declaration that it "is committed to continuing to grow the amount of EE and DSM resources utilized to meet customer growth." DEC IRP, p. 78. Instead, these IRPs show the growth of EE and DSM resources remain static of shrink year after year.

F. Duke's 2018 IRPs rely excessively on new gas generating capacity.

Both DEC's and DEP's 2018 IRPs feature a heavy reliance on new gas plants. Gas generation is subject to numerous uncertainties, such as fuel cost volatility, potential supply disruptions, and carbon regulation. As more energy efficiency programs and renewable energy resources and battery storage are added to the Companies' resource mix, the need for additional gas-fired capacity—and the associated risks and costs—is diminished or delayed.

G. Duke should evaluate accelerated retirement of coal plants.

Petitioners have previously identified Duke Energy's failure to use its extensive modeling resources to fairly evaluate the cost-effectiveness of coal retirements. Yet Duke continues to

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determine the timing and amount of coal retirements based not on economics, but based on the depreciation book life of the coal plants. This approach continues to cost ratepayers. In developing the 2018 IRPs, the Companies used a flawed and incomplete analysis of their existing coal fleet.

The Companies have not performed a full economic comparison of existing and new resources. Instead, the Companies have hard-wired the projected lifespans of their existing coal units, preventing a fair comparison of the economics of these units relative to other resources. This methodology inhibits the pursuit of potentially lower-cost options. While the Companies' modeling analysis was limited, it shows that many of their coal units are forecast to run at low capacity factors. Given the high fixed costs of keeping coal units online, it is highly unlikely that continued reliance on aging coal plants is a cost-effective strategy for South Carolina ratepayers.

DEC and DEP should study continued investment in their aging coal units in comparison to unit retirement and replacement. This analysis of coal unit economics should be transparent and involve stakeholders, preferably throughout the decision-making process. The IRP process is the right time for the Companies to evaluate the future of their units, and this proceeding presents a prime opportunity for the Commission to review that evaluation.

CONCLUSION

While the IRPs are planning documents, they have implications for important decisions that will face the Commission in the future. For example, the IRP is the basis for a utility's decision to build or acquire a new generating resource, and typically serves as the basis for application for a certificate to build a new power plant. Assumptions and conclusions made in the IRPs also underpin utility calculations of avoided costs, which themselves have implications for rates paid to independent power producers and for cost-effectiveness testing of DSM/EE

programs. And most fundamentally, the IRP is the place where each utility discloses the cost of each portfolio—costs that will ultimately be borne by ratepayers.

We ask that the Commission review the 2018 DEC and DEP IRPs carefully, consider these comments and those of other intervenors and ORS, and require the Companies to correct any deficiencies identified by the Commission in light of these comments.

Respectfully submitted this 15th day of February, 2019.

s/ Stinson W. Ferguson

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In the Matter of:	)	
	)	
Duke Energy Carolinas, LLC and	)	CERTIFICATE OF SERVICE
Duke Energy Progress, LLC	)	
Integrated Resource Plans	)	

I certify that the following persons have been served with one (1) copy of the Petitioner's Initial Comments on Duke's 2018 IRPs by electronic mail and/or U.S. First Class Mail at the addresses set forth below:

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This the 15th day of February, 2019.

s/ Rachel Pruzin